RJP60D0DPP-M0

Silicon N Channel IGBT
High Speed Power Switching

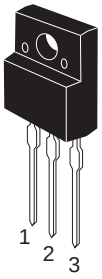
R07DS0173EJ0100
Rev.1.00
Mar 11, 2011

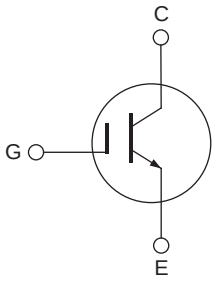
Features

- Short circuit withstand time (5 μs typ.)
- Low collector to emitter saturation voltage
  $V_{CE(sat)}$ = 1.6 V typ. (I_C = 22 A, V_{GE} = 15 V, Ta = 25°C)
- Gate to emitter voltage rating ±30 V
- Pb-free lead plating and chip bonding

Outline

RENESAS Package code: PRSS0003AF-A)
(Package name: TO-220FL)





1. Gate
2. Collector
3. Emitter

Absolute Maximum Ratings

(Ta = 25°C)

Item		Symbol	Ratings	Unit
Collector to emitter voltage		V_{CES}	600	V
Gate to emitter voltage		V_{GES}	±30	V
Collector current	Tc = 25°C	I_C	45	A
	Tc = 100°C	I_C	22	A
Collector peak current		ic(peak) Note1	90	A
Collector dissipation		P_C Note2	35	W
Junction to case thermal impedance		θj-c Note2	3.57	°C/ W
Junction temperature		Tj	150	°C
Storage temperature		Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at Tc = 25°C

Electrical Characteristics

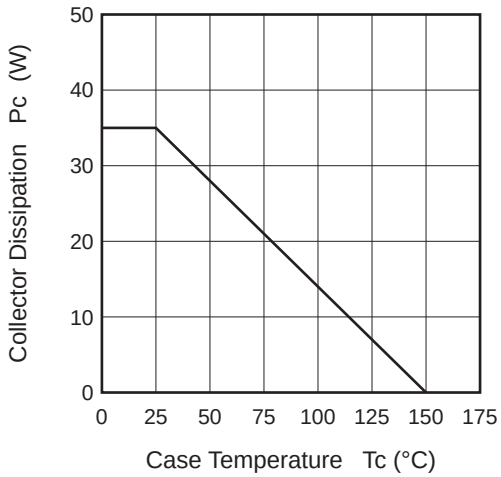
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I_{CES}	—	—	5	μA	V_{CE} = 600 V, V_{GE} = 0
Gate to emitter leak current	I_{GES}	—	—	±1	μA	V_{GE} = ±30 V, V_{CE} = 0
Gate to emitter cutoff voltage	$V_{GE(off)}$	4.0	—	6.0	V	V_{CE} = 10 V, I_C = 1 mA
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.6	2.2	V	I_C = 22 A, V_{GE} = 15 V Note3
	$V_{CE(sat)}$	—	2.0	—	V	I_C = 45 A, V_{GE} = 15 V Note3
Input capacitance	Cies	—	1050	—	pF	V_{CE} = 25 V V_{GE} = 0 f = 1 MHz
Output capacitance	Coes	—	70	—	pF	
Reveres transfer capacitance	Cres	—	32	—	pF	
Total gate charge	Qg	—	45	—	nC	V_{GE} = 15 V V_{CE} = 300 V I_C = 22 A
Gate to emitter charge	Qge	—	6	—	nC	
Gate to collector charge	Qgc	—	20	—	nC	
Switching time	$t_{d(on)}$	—	35	—	ns	V_{CC} = 300 V, V_{GE} = 15 V I_C = 22 A Rg = 5 Ω (Inductive load)
	t_r	—	20	—	ns	
	$t_{d(off)}$	—	90	—	ns	
	t_f	—	70	—	ns	
Short circuit withstand time	t_{sc}	3.0	5.0	—	μs	V_{CC} ≤ 400 V, V_{GE} = 15 V

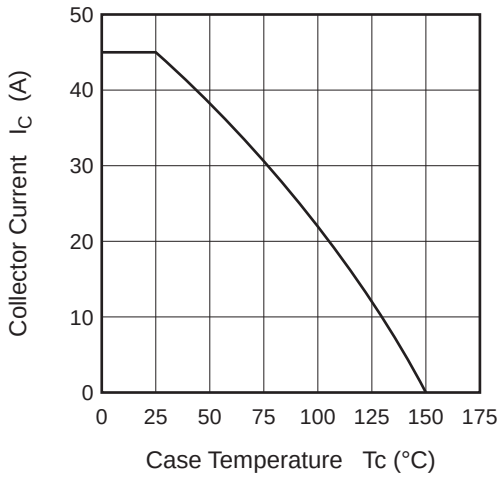
Notes: 3. Pulse test

Main Characteristics

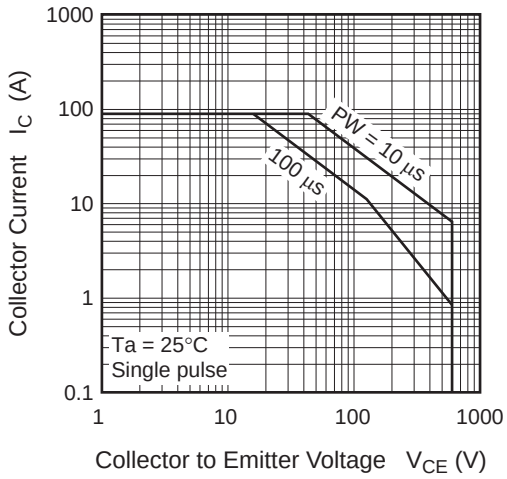
Collector Dissipation vs. Case Temperature



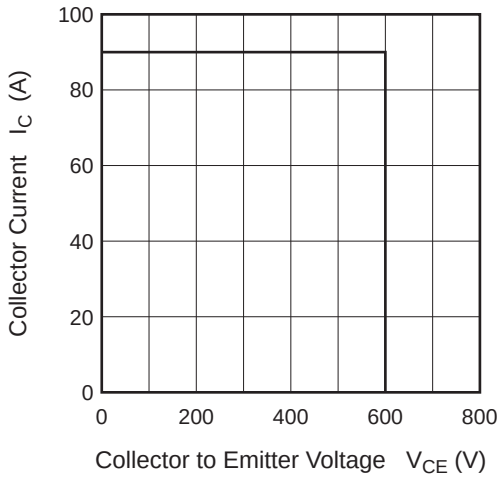
Maximum DC Collector Current vs. Case Temperature



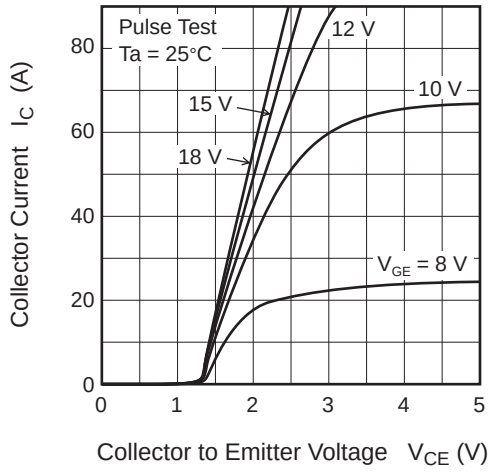
Maximum Safe Operation Area



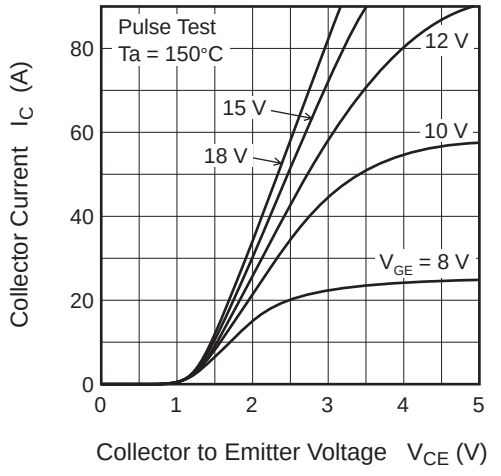
Turn-off SOA



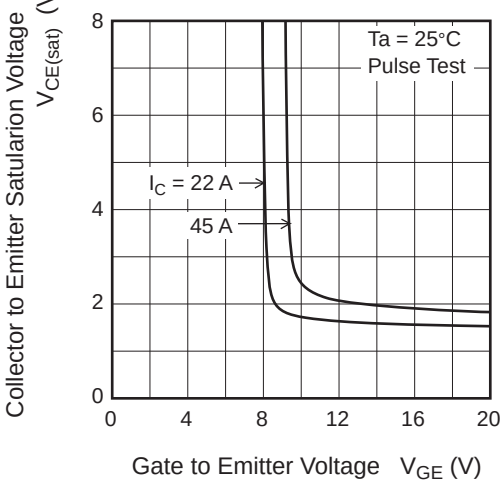
Typical Output Characteristics



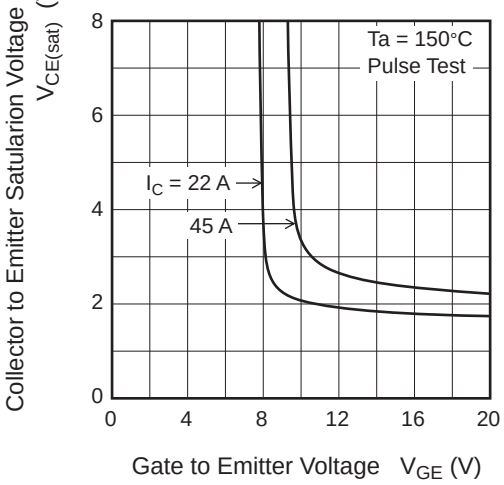
Typical Output Characteristics



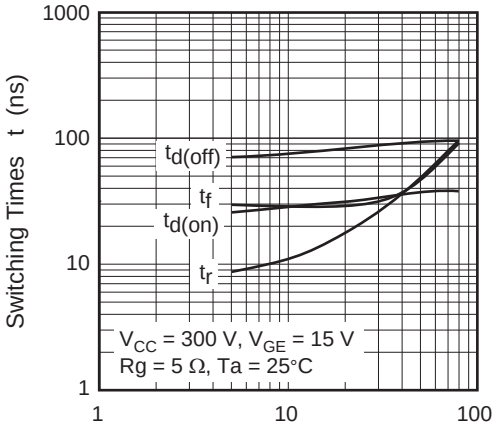
Collector to Emitter Satularion Voltage vs.
Gate to Emitter Voltage (Typical)



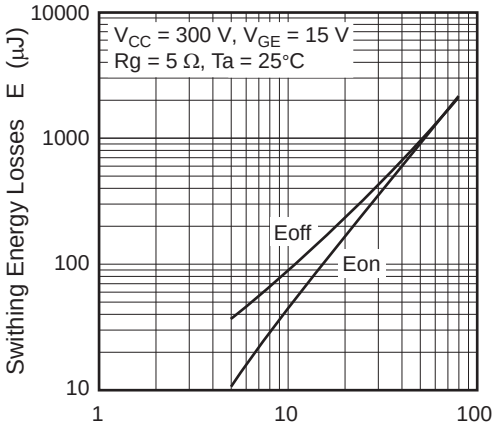
Collector to Emitter Satularion Voltage vs.
Gate to Emitter Voltage (Typical)



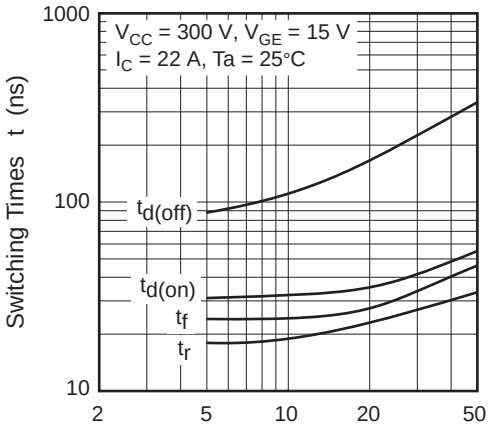
Switching Caracteristics (Typical) (1)



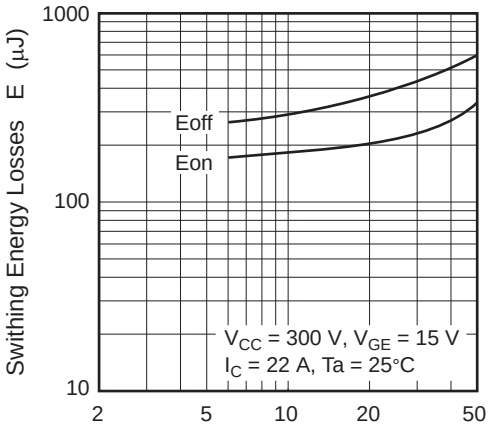
Switching Caracteristics (Typical) (2)



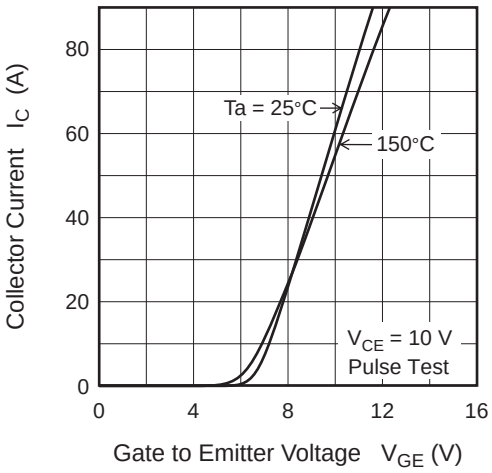
Switching Caracteristics (Typical) (3)



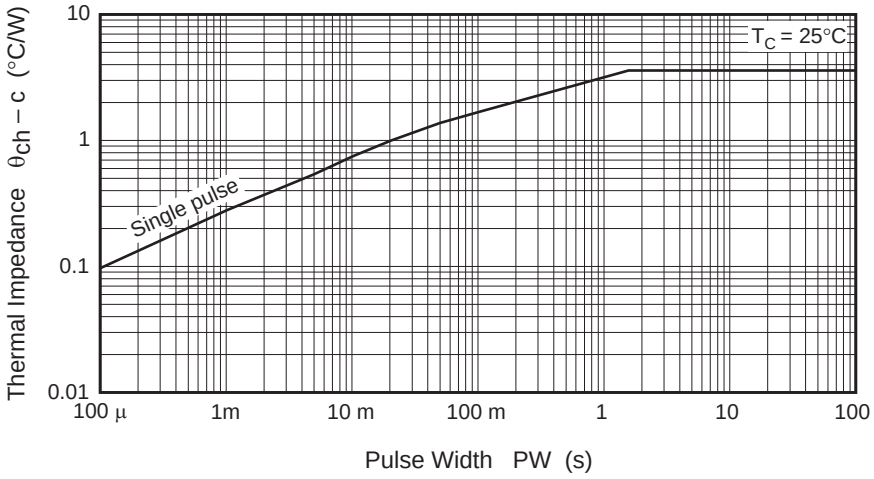
Switching Caracteristics (Typical) (4)



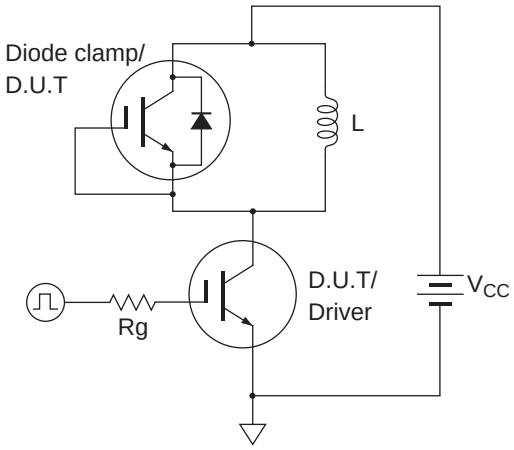
Transfer Characteristics (Typical)



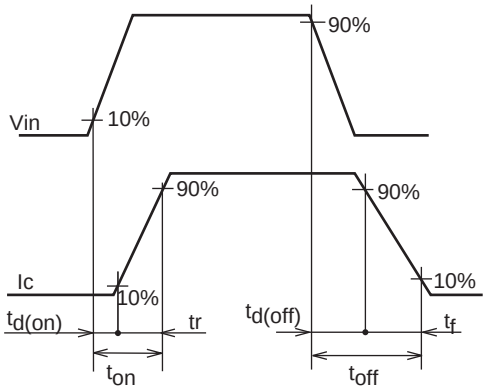
Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



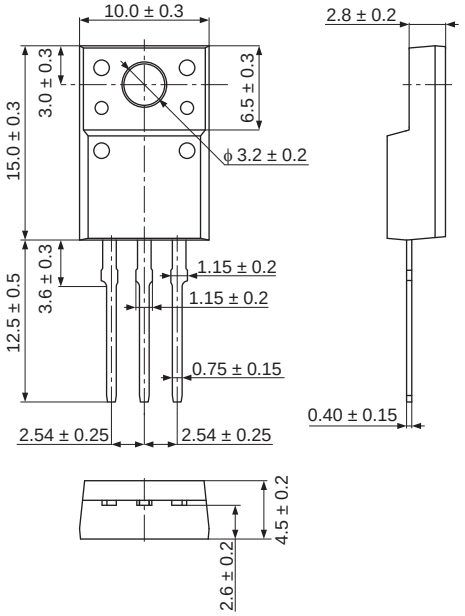
Waveform



Package Dimension

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220FL	—	PRSS0003AF-A	TO-220FL	1.5g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJP60D0DPP-M0-T2	1050 pcs	Box (Tube)

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